



Colorado's Economic Recovery: Practical Next Steps to Growth and Resilience December 2020

In the relatively near future, Internal Combustion Engine (ICE) cars will be few and far between. The proliferation of Electric Vehicles (EV) will turn the roar of the largest highways into a quiet hum. Standing in the center of the largest, most prosperous cities, there will be fresh air. Companies will be responsible for the resources they use and the products they sell, ensuring sustainable practices. There will be no residential housing near refineries or waste-management sites. The cost of energy will continue its precipitous drop, causing a major boost in economic opportunity and social equality.

Until you walk outside your home to see, hear and breathe that reality, we will continue to live in a society that perpetuates the misuse of resources and a pollution-based energy economy. Cumulative emissions will cause more frequent forest fires as we waste precious natural and financial capital. This does not need to be the case.

Leaders at every level of government and private industry have the power to both drive innovation and act on existing cost-effective energy solutions. The Batesville, Arkansas school district, for example, recently did both by installing a solar array and pumping energy savings back into teacher's salaries.¹

At this point in time, the path for Colorado's energy transition is unclear. This is causing increased climate and economic volatility, resulting in an avoidable level of risk. Urgency is often driven by the risks associated with our air and atmosphere inundated with toxic particulate matter. The tech and business community see another strong case made by economics. The sooner we move, the greater the potential for economic growth and job creation, all toward a cleaner, more equitable society. Colorado is on the cusp of an economic transition that will fundamentally recast the foundations of our state's economy. There is extraordinary potential for value creation on our doorstep that can make Colorado an economic powerhouse of the next 20 years and thereafter.

We recognize the scale of the challenge, with the capital required and the political risk resulting from systemic changes. But, as we emerge from the COVID-19 recession, the public sector cannot invest in propping up extractive industries. The heavy industry of the 20th century is no longer economically or environmentally viable.

We believe that substantial progress can be made through shrewd stimulus investments, public-private information sharing, and regulatory adjustments. With guidance and input from the state on how policy and regulation will change to meet emissions reductions goals over the

next 20 years, Colorado's entrepreneurs can build businesses and innovate with a reasonable risk tolerance. That's why we are suggesting the construction of a collaborative framework, and the tech and business leaders of Colorado are ready and willing to support the state.

This report is compiled from in-depth research, as well as conversations with experts, decision makers, and input from the tech community. The purpose is to offer a few key actionable recommendations in order to create a system where everyone has the chance to work and live in a clean energy economy.

Financial Indicators: Green Bank and Accelerator

The state has yet to tap its full potential to guide and galvanize mainstream entrepreneurs and investors toward green innovation. Asset managers are chomping at the bit to invest in clean technologies that have already reached a levelized cost.^{2,3} However, there remains a level of perceived risk in the cleantech space, reporting is new, and many projects are still too small. These are concerns that can be alleviated with financial signals from the state to prove that these are low-risk, long-term investments.

Investing in the Green Bank — the Colorado Clean Energy Fund (CCEF) — is a critical first step. This shows that the state is ready to underwrite the energy transition and remove the assumed financial barriers for private investment. The Colorado Clean Energy Fund uses innovative instruments, such as credit enhancements and warehousing and aggregation tools, that can support clean energy projects that are underserved by traditional investors. For example, the Green Bank can aggregate smaller but equally important projects, such as electrifying Colorado's buildings, which will dramatically increase energy efficiency and reduce state-wide emissions.

To drive continuous growth and impact, the proposed \$30M investment in the bank needs to be combined with federal stimulus and structured to attract the next billion of private capital. The CCEF is well-positioned with a range of financial products that are aligned with state programs to begin financing renewable energy and beneficial electrification projects, paving the way for the next tranche of cleantech investments. The state should do everything in its power to support these efforts.

Investing and resourcing the CCEF will open the flood gates to outsized economic growth for a host of reasons: 1) Each dollar will be matched and compounded by the private sector. 2) It will show that Colorado is a leading cleantech market, and 3) a place where entrepreneurs can experiment and collaborate. 4) Their ability to invest in low-income community energy will address rampant pollution problems, covering climate along with the social, health, and wealth disparities. 5) Finally, it will foster a job market with the best talent on the issue defining of our time.⁴

The widely cited statistic from E2 pertaining to job growth in the energy sector shows that "clean jobs outnumber fossil fuels jobs nearly three to one (3.26M to 1.17M)."⁵ Furthermore, pre-pandemic job growth in energy efficiency also saw a consistent rise.⁶ Our state's investment

in making our built infrastructure more efficient can continue that trend. Therefore, we encourage the state to see this as a primary job creation mechanism and dedicate continued resources toward the bank, including sharing information widely with the tech community about the associated opportunities. Instead of continuing to allocate state funds and incentives toward our extractive industries, investing in cleantech is the most efficient way to get Colorado back to work.

We also recommend dedicating federal stimulus dollars toward a clean energy accelerator that could work alongside the Green Bank. New technologies and companies in the energy industry face barriers to entry associated with burgeoning markets, such as competition with government-backed monopolies. We propose an accelerator that would connect participants with state and industry leaders who could mentor new companies and fast-track their applications for pilots and contracts, as well as help them refine their business models and operations. An accelerator would take the capital of the Green Bank and couple it with custom resources, connections, and partnership opportunities to rapidly scale innovation for a cleaner future.

So far, few accelerator programs have had the targeted direction that the state can provide in the evolution of a greener economy, bringing together state-level vision with local climate resilience needs. Let's arm our cleantech entrepreneurs with up-to-date insight into the state's evolving climate goals and give them support to make Colorado a leading tech hub for green innovation.

As the state works across industries in different capacities toward a renewable energy economy, moving capital will be paramount. Public sponsorship of initiatives like a Green Bank and accelerator will not only show the financial markets that Colorado is ready for large-scale cleantech investment, but also create a collaborative feedback loop between the state and the tech and business community.

Unleash the Energy Sector To Create Cost-Effective Resilience

The cost of solar and wind energy have dropped sharply since 2009, falling 90% and 70% respectively. The cost of capital per megawatt hour for solar and wind has also fallen to below half that of coal generation.⁷ At the same time, Coloradans struggle to pay utilities bills, a problem that skyrocketed with the COVID-19 recession.

Renewable energy prices are not only a chance for Colorado's large utilities to move more swiftly toward decarbonization, but they are also an opening for widespread renewable Distributed Generation (DG). With the right incentives, DG can lower energy costs for a wide range of Colorado's citizens and businesses. The current barriers to DG are the upfront cost of hardware and regulations established with Colorado's Renewable Energy Standard (RES) in 2004 when wind and solar were substantially more expensive.⁸ These regulations are outdated.

The state can start by raising the cap on Net Metering (NEM). Regulations for DG should encourage energy savings by allowing users to offset higher quantities of energy that they

generate. At first, expanding NEM regulations does not require funding. As funding becomes available, the state can expand existing energy efficiency programs. Plus, federally, there is bipartisan support for renewable energy incentives. So the state should direct federal stimulus toward additional rebates that can mitigate the cost of purchasing and installing hardware for wind and solar.

There are many other advantages of DG and NEM, especially in the short term. Liberating local energy regulation will help communities access cost-effective renewable energy, further develop competition for small energy businesses and, moreover, raise public awareness on developing renewable energy solutions. The visual of DG projects proliferating across the state will give communities and individuals a sense of momentum amidst a score of global crises that many feel helpless to engage with.

With the COVID recession, Colorado's net employment loss in the first 6 months of 2020 was 216,700 jobs.⁹ While household energy demand remains inelastic, we need a new regulatory environment that will give Coloradans options to lower their utility bills going forward and drive our state's economic recovery. Improving the DG and NEM landscape is ultimately an equitable, cost-effective emissions reductions strategy.

Preparing for Disruption

Even with the immediate challenges, we must increasingly include future innovation into today's plans. As a state and a nation, innovation is at the heart of our competitive advantage. We can solve many of our 2030, 2040, and 2050 emissions reductions goals by realigning our economy with cleantech innovations coming down the pipeline.

Specifically, in the transportation sector, the confluence of the rise in autonomous, electric vehicles, and ride-sharing businesses will bring about a dramatic drop in personal car ownership in the next two decades.¹⁰ If we establish clear economic opportunities for auto and tech companies at the forefront of these trends, we can simultaneously harness economic growth, drive job creation, and expediently lower our emissions into the future.

Colorado is already doing a commendable job of pushing innovation in the transportation sector as a central emissions reductions strategy. But, there is more the state can do to leverage this upcoming disruption.

Develop a cleantech innovation hub in partnership with CU Boulder where the best and brightest are engaged in electrifying the transportation industry. This can be a well-informed community where researchers collaborate with existing transportation businesses to further develop creative solutions and innovative business models. In partnership with a state-sponsored Green Bank, promising ideas and businesses originated here would have the opportunity to receive funding and support from the accelerator (mentioned above).

As an example, in the transportation industry the emerging "as-a-service" business model has already entered the mainstream with ride-sharing businesses like Uber and Lyft. Continuing to

develop services-based models and contracts will benefit the renewable energy tech space for both the transportation and energy industries that need creative ways to enter the market.

Additionally, as an outdoor and recreational destination, Colorado can create pollution-free destinations. This could act as another signal and invitation to the auto and tech industries. While some states have moved to create pedestrian-only streets, pollution-free areas could include toll roads, HOV lanes, parks and other places where EV's will gain discounted or free access. Federal stimulus dollars can be used to account for any revenue lost at the state level. As EV prices drop and EV ride-sharing becomes widely available, pollution-free destinations will boost EV sales, show people that Colorado's economy is serious about a clean future and encourage innovators to join our startup community and grow our clean energy job market.

In light of the technological disruptions underway, many of the gaps in the state's climate roadmap can be filled through fostering innovation and establishing clear signals to the business community that Colorado is willing to lead.

The Next 20 Years

Public-private collaboration can be integral to driving energy innovation toward our shared goals. Even though there will be unexpected developments along the way, we can still emulate a central practice of successful entrepreneurs by creating what Brad Feld calls a "20-year view from today."¹¹ Our emissions reductions roadmap has 20-year goals, but lacks specifics that can catalyze and guide growth in the cleantech community. Therefore, we strongly encourage the state to lay out clear priorities with enforceable deadlines that will hold us all accountable.

Federally, many of the current administration's rollbacks on environmental regulations have done irreparable harm.¹² The cumulative effect of emissions has reached dire proportions. While the next presidency will make advances in energy and climate, there is still a great deal of uncertainty in national politics. We feel this is a time for new leaders to emerge, and the tech and business community would like to collaborate with the state to drive the development of the cleantech sector in Colorado.

We can bring about historic economic growth by creating financial indicators for mainstream investors, unleashing the community-level renewable energy industry, and dedicating the state's data and planning resources to align emissions reductions goals with technological disruption.

Together, we can bring about a social contagion of Coloradans innovating toward a cleaner, more just future. Our state, economy and planet depend on it.

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